ACP Science and Technology Programme

AFS/2009/219015

AFROweeds
African weeds of rice

ANNEX VI
INTERIM NARRATIVE REPORT

16th October 2011

Thomas Le Bourgeois – Cirad
Pierre Grard – Cirad
Pascal Marnotte – Cirad
Jonne Rodenburg – AfricaRice

ANNEX VI

INTERIM NARRATIVE REPORT

- This report must be completed and signed by the Contact person
- The information provided below must correspond to the financial information that appears in the financial report.
- Please complete the report using a typewriter or computer **(*you can find this form at the following address <Specify>).***
- Please expand the paragraphs as necessary.
- ***Please refer to the Special Conditions of your grant contract and send one copy of the report to each address mentioned***
- The Contracting Authority will reject any incomplete or badly completed reports.
- The answer to all questions must cover the reporting period as specified in point 1.6

1. Description

1.1. Name of beneficiary of grant contract:

CIRAD Centre de Coopération Internationale en Recherche Agronomique pour le Développement (International Cooperation Centre for Agronomic Research and Development)

1.2. Name and title of the Contact person:

Dr Thomas Le Bourgeois, Weed scientist

1.3. Name of partners in the Action:

Africa Rice Center (AfricaRice)

1.4. Title of the Action:

African Weeds of Rice (AFROweeds)

1.5. Contract number:

AFS/2009/219015

1.6. Start date and end date of the reporting period:

16th of October 2010 – 15th of October 2011

1.7. Target country(ies) or region(s):

West, Central and East Africa

1.8. Final beneficiaries &/or target groups[1] (if different) (including numbers of women and men):

The target groups are weed scientists and agronomists working at universities or national research institutions and technicians working for development organizations, extension or crop protection services in Africa. Agronomy and weed science students are also an important target group as the tools and information generated by AFROweeds will be used to back up training and teaching.
To date, 43 people have registered as a member at the AFROweeds collaborative online platform.
Fig. 1 shows the distribution of members among different types of institutions interested in this project, while Fig. 2 shows the geographical origin of members and Fig. 3 the sex ratio of members.

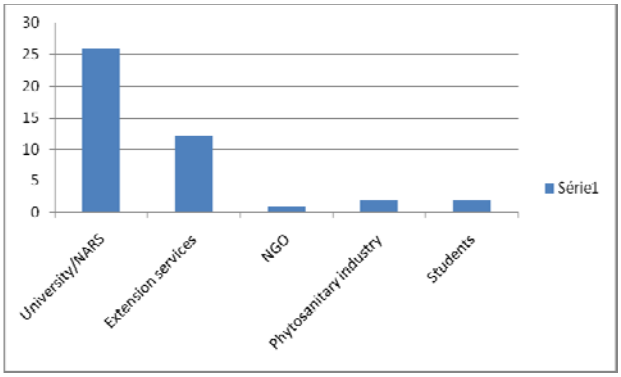

Fig. 2: Geographical origin of members

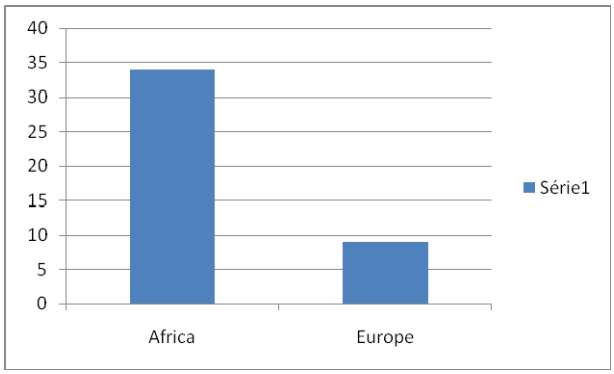

Fig. 1: Institutional belonging of members

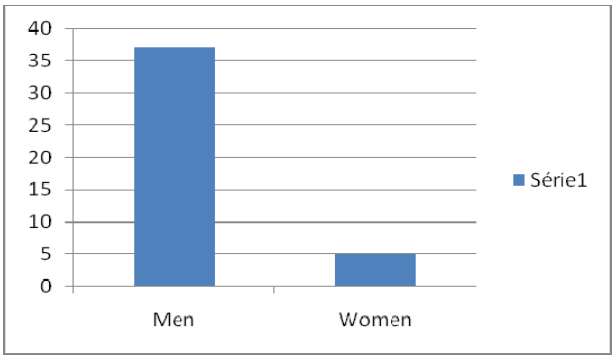

Fig. 3: Sex ratio of members

At the moment, scientists represent the bigger group of members, but extension people are really increasing rapidly since they have been invited to attend the second workshop and have been met during field visits. Women members are also increasing, they are mainly from research (scientists or students) and industry.

The final beneficiaries are the African rice growers who should be able to enhance rice crop production through better weed control and the populations of participating countries who should gain access to larger national rice crop production, making them less dependent on rice imports.

1 "Target groups" are the groups/entities who will be directly positively affected by the project at the Project Purpose level, and "final beneficiaries" are those who will benefit from the project in the long term at the level of the society or sector at large.

Furthermore, the project is conducted in conjunction with national farming research and development systems and should greatly enhance their capacities and intra- and inter-institutional collaboration.

1.9. Country(ies) in which the activities take place (if different from 1.7):

The AFROweeds project comprises those countries of West, Central and East Africa with significant rice crop productions. Initially, since the AfricaRice partner is established in Benin, Senegal and Tanzania, these countries were given priority. In the first year the active member countries concerned were: Benin, Senegal, Côte d'Ivoire, Mali, Burkina Faso, Nigeria, Ghana, Chad, Kenya, Uganda and Tanzania. In the second year we enhanced this group by three more countries from East- and Southern Africa: Rwanda, Mozambique and Zambia. A few members are based in the Netherlands and France but involved in research for development with a focus on African rice production.

2. Assessment of implementation of Action activities

Remarks on assessment of implementation of Action activities:

Mr. Pham Ngoc Hai was recruited by Cirad at Hanoi – Vietnam as Web manager of the project, for a 24 months contract from 01 November 2010 to 31 October 2012.

Mr. Pham Trung Doan was recruited by Cirad at Hanoi – Vietnam for Web management and computor development in IDAO SVG for the AFROweeds project, for a 12 months contract from 01 April 2011 to 31 March 2012.

During the second year of the project, the Research Technician K. Aloys got an MSc scholarship for Belgium and left end of July while her replacement only started on 1 October 2011.

Pascal Marnotte from Cirad moved to the French Embassy at Cotonou – Benin in April 2011as a "Technical assistant". Thus he is no longer a Cirad participant of the project but he still is a local partner of the AFROweeds project.

The project encountered difficulties from partners to contribute, they all are motivated in the project but until now most of them have not contributed a lot. Only two (Benin and Côte d'Ivoire) have sent information on the species. Eight partners from Côte d'Ivoire, Benin, Nigeria, Rwanda, Mozambique, Ghana, Burkina Faso and Mali have sent images and only the partner from Nigeria have sent herbarium specimen images.

Mr. Fredy Kouame, a Phd student of the University of Abidjan-Cocody (Côte d'Ivoire) working on rice weeds, was planned to spend two months early 2011 at Cirad Montpellier to analyse his data and manage them in the AFROweeds database. But Côte d'Ivoire's troubles made this visit impossible until now.

Note that the collaborative approach and tools used are very new to most of people involved in the project. Their use is not always easy and requires a little practice. The partners often have no permanent access to the Internet which does not facilitate their work.
In the next months we hope that they will strengthen their use of the platform tools, and the more they will consult documents and species information the more they will contribute with comments or sending images or information on weeds and weed management.

2.1 Activities and results

Please list all the activities in line with Annex 1 of the contract during the reporting period

Activity 1: ***Project launch, preparation of the website and preparation of the project exchange platform and modalities***

Activity 1a: Open the project website

The AFROweeds project website (http://www.afroweeds.org) came online during the initial workshop in February 2010. It was rebuilt with a new frame by the end of 2010 and was complemented by the collaborative platform in 2011.
Currently the Website is a public space where the project is presented and information and project results are made available to the general public.
This comprises a home page with a presentation of project objectives, partners and grant suppliers (Fig.4), from which several thumbnails allow access to different pages:

- **Activities** - to present workshops results and field works.
- **Resources**
  - Compilation of bibliographical references on rice weeds, flora and field guides, weed control, technical and scientific papers (Fig. 5),
  - Botanical resources such as Internet links dedicated to systematic or botanic purpose,
  - The list of rice weed species selected by all the partners during the initial workshop with a direct access to their HTML description and illustrated sheet (Fig. 6),
  - The AFROweeds identification system (Fig. 7).

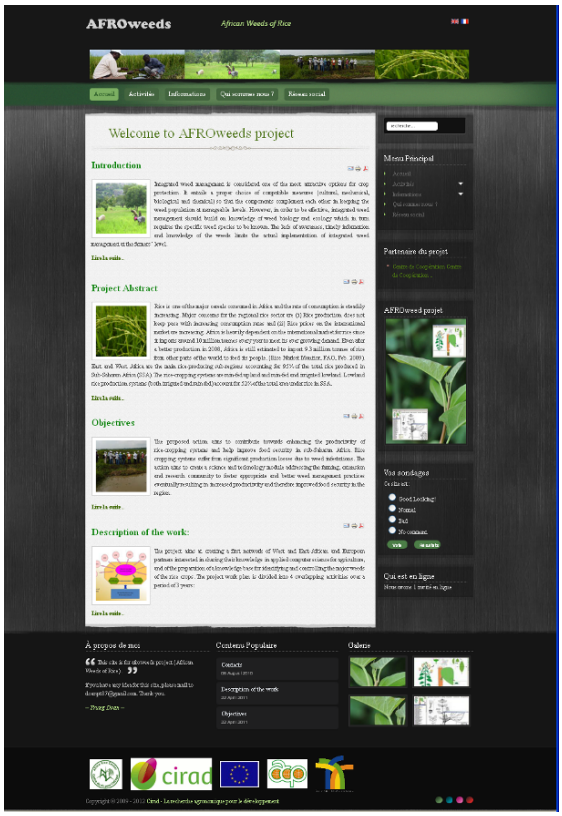

Fig.4. Home page of the AFROweeds project Website.

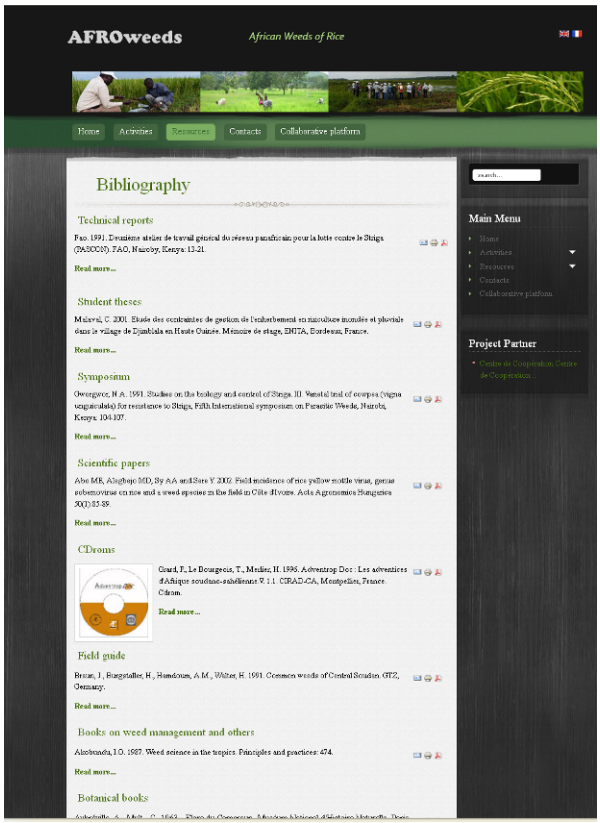

Fig. 5: Bibliography page

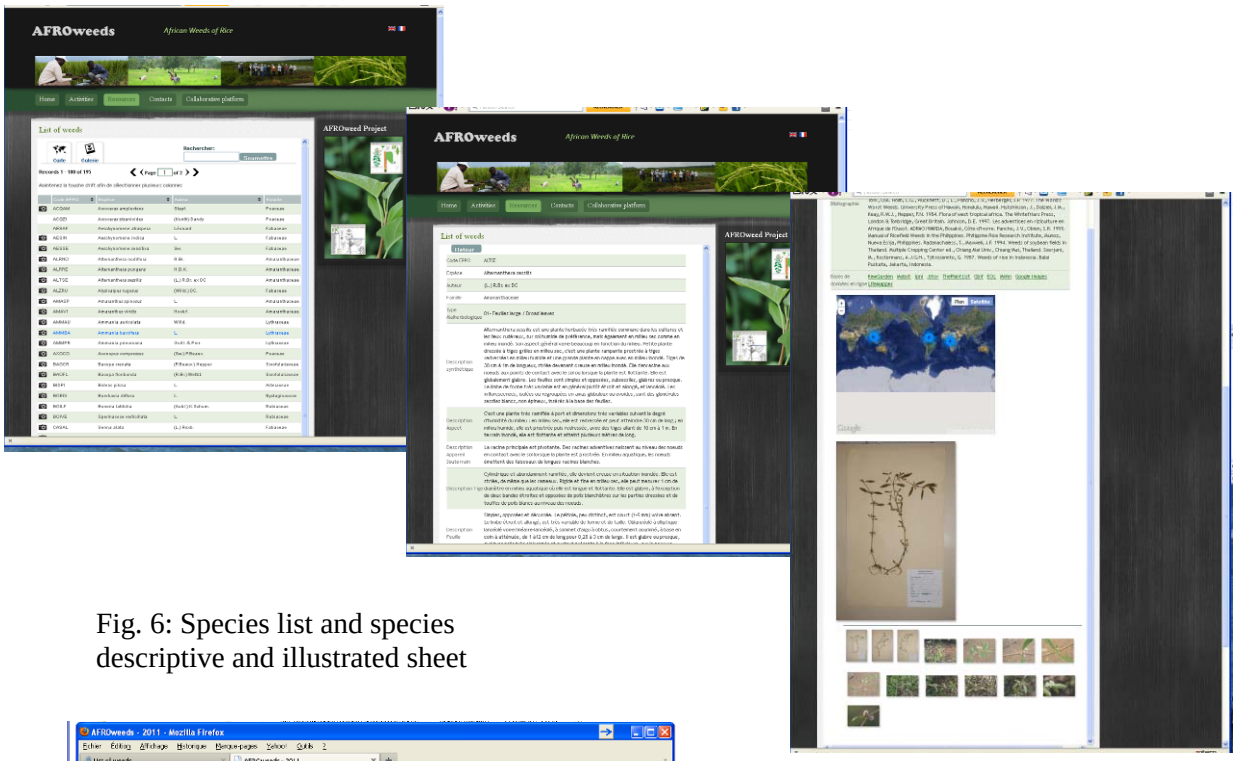

Fig. 6: Species list and species descriptive and illustrated sheet

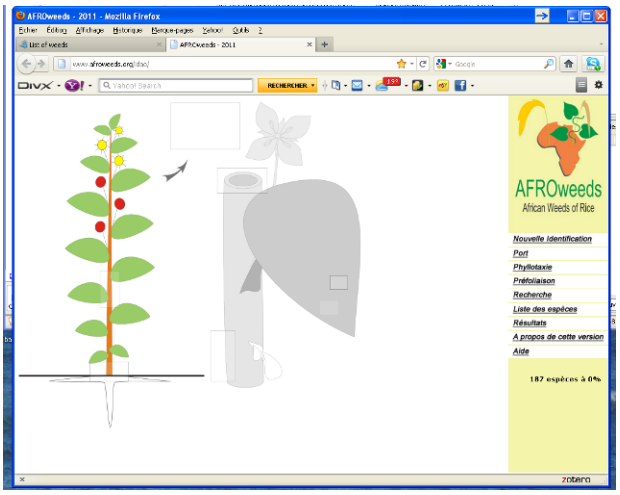

Fig.7: AFROweeds identification page

- **Contacts** – with coordinates of the main Cirad and AfricaRice partners involved in the project.
- **Collaborative platform** – to access directly the Web 2 collaborative platform of the project where members can share their information, documents, knowledge, questions, photos, etc.
- **News** – to present the last events of the project.
- **Links** – to other Websites related to rice production or weed management in rice, such as DIVECOSYS in Africa (http://divecosys.e-monsite.com), SAED in Senegal (http://www.saed.sn), and CCR-MC in Benin (http://crrmc.ilemi.net). They also have a link to the AFROweeds Website (Fig.8).

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Fig. 8: Examples of links to AFROweeds from DIVECOSYS and CCR-MC Websites.

Thus, step by step, we are creating a network of websites dedicated to rice production and weed management

The project website is operational and can be accessed by the general public (project partners and target players). It is updated regularly. To date it is mainly in English but its translation in French is ongoing. An automatic translation of the web pages in French, English, Portuguese or other languages is possible using the Google Chrome navigator.

Activity 1b: Open the Web 2.0 participatory tools

This activity was postponed until the beginning of year 2 of project execution and is now fully operational. It has been developed using the Open Source Social Networking Engine Elgg[2] 1.8.0.1. It enables partners and project coordinators to have online forum discussions, to exchange information, data and photos and to find new professional contacts.

This collaborative platform is available at the address: http://www.afroweeds.org/network/

All members of this Web 2.0 platform needed to register themselves with a login and password with a minimum of information about the personal profile such as location, institution, and type of institution, professional activity, Interest, e-mail address.
This use of registration could be considered a constraint for people who would just like to have a look to the platform but it has been recognized essential. This information allows platform administrators to keep off any hacking of the platform.
All along this first year of use of the AFROweeds platform, we have had to face a lot of hacking attempts.
Thus, the public can consult the Website which synthesises a lot of information of the project and give access to species identification and information and when they want to participate to the project and share knowledge or questions with other members they use the collaborative platform after registration.

This Web2.0 collaborative platform is structured on working groups several screens of the AFROweeds Web 2.0 collaborative platform are presented in Appendix 1.

At the moment there are height working groups (Fig. 9)

[2] Elgg : http://elgg.org/

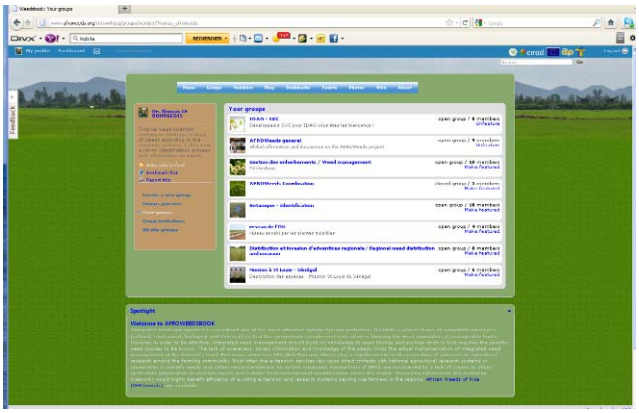


Fig. 9: List of the nine working groups of the AFROweeds collaborative platform

- **AFROWeeds general** – is an open group for any member and gives global information and allows discussions on the project itself and its management.

- **AFROWeeds coordination** – is a restricted group concerning only AfricaRice and Cirad main partners, to work all together on the coordination of the project. All the agenda and reports of the coordination Skype meetings (5 during the second year) are managed and stored in the group pages. This allows any member to add comments or update the pages.

- **Weed management** – is an open group dedicated to discussions, and documents on weed control

- **IDAO SVG** – is an open group focused on the computer development of the identification system using the IDAO process.

- **Identification** – an open group. It concerns discussions, sharing documents and photo albums of weeds that people cannot identify and ask the help of other members of the project.

- **Réseau de l'ON** –is an open group focused on the weed management of irrigation canals at the Office du Niger.

- **Regional weed distribution and invasion** – is an open group for members to share information and discussions on the regional distribution and invasiveness of problem species in order to align and prioritize the collaborative work

- **Mission Saint Louis Senegal** – is a restricted group for Cirad and SAED people to discuss about the results of the field trips and prospection done in Senegal in September 2011.

Any member of the platform can create a new group and animate it, inviting other members to join the group and participate.

A lot of tools are at disposal to members to work in the groups, but, until now only those considered the most interesting have been selected in order to train gradually members in their use (see example of the AFROWeeds general group in Appendix 1):

- **Group Discussion –** Any discussion can be launched by a member. He/she has to mention the title and the subject of the discussion. Any member of the group can participate to the

discussion adding his/her comment. Each comment is referenced by its author, and date of posting. A comment can include text and Web link.

- **Group Bookmarks –** To inform members on interesting Web sites or Web pages and give the URL address.

- **Group pages** – Pages which can be written and commented by any member of the group. Several pages have been used for agendas and reports of coordination meetings.

- **Group files –** To store any document of interest such as grey literature, scientific papers, technical reports, protocols etc. in Word or pdf document. The documents are uploaded and made available for consulting or downloading.

- **Group albums –** To share photos from workshops, field trips etc. Or on weed management, weeds, or unidentified weeds for comments or assistance in identification by other members.

- **Group videos** – To share videos on weed management. For example, a 17 mn video on rice weed management published by AfricaRice is available in the working group "Weed management".

Other tools such as "Blog", "Event calendar", "Presentation", "Polls" could be made available later if necessary, depending on each working group's needs.

While logging on the collaborative platform, a member can see directly what are the last events happened in any working group he is a member of. All events are listed by categories (Members, Groups, Discussions, Bookmarks, Files, Pages, and Videos) and by date.

A feedback thumbnail is available from every screen. Any user can send a feedback (positive or negative) on the use of the collaborative platform.

An e-mail system allows members to send e-mail to other members, to members of a working group or to all the members of the platform. This tool is very useful to inform members of a group or all the platform members about any event.

The AFROweeds Web 2.0 collaborative platform is still under construction and evaluation, but it is already very useful even if it needs some training for an efficient use. Such a training session occurred during the second workshop of the project at the AfricaRice Research Station (Cotonou – Benin) in June 2011, with African partners.

Statistics of the AFROweeds Collaborative platform:

Since the posting of the new Website of the project in March 2011 until October 2011, we recorded 24.537 visits and 249.355 page views
The Fig.10 shows the evolution of visits and page views along the months. During the first months, the big amount of page views is partly related to the Web manager and coordination work on the Website.

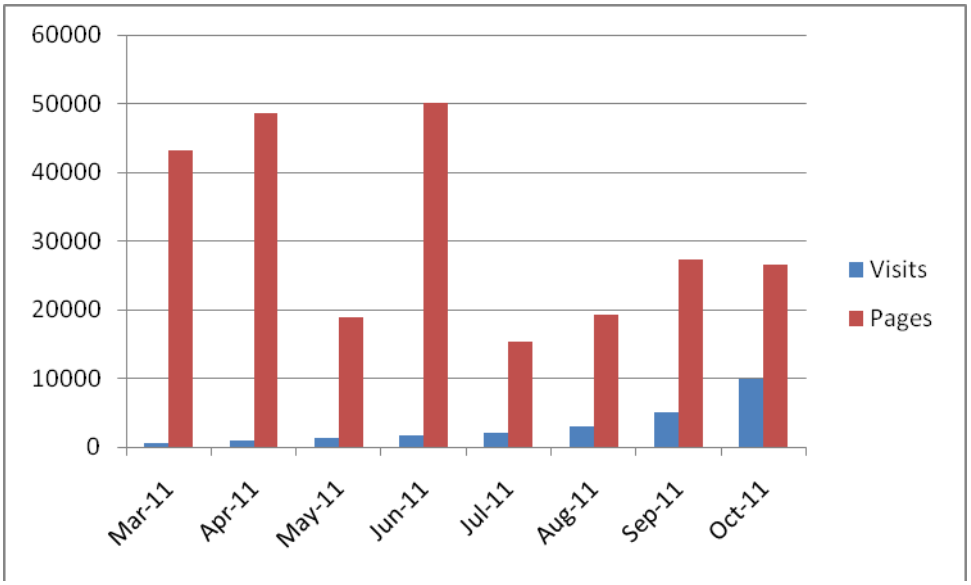


Fig. 10: Statistics of the AFROweeds collaborative platform and Website visits

Monthly statistics are presented in Appendix 2. Lots of hacking attempts were from China which makes difficult the acceptation of people from China really interested in rice weeds.

Activity 2: *Collection and compilation of existing knowledge resources on the weeds of rice of West and East-Africa, from NARS and partners involved in the project*

Activity 2a: Bibliography

An enumeration of botanical works, practical recognition field guides, identification software, scientific papers, conference communications, student dissertations and technical reports on weeds of rice or on rice crop weeding in Africa but also world-wide, has been undertaken by the various partners.

To date, the literature review includes 413 references corresponding to:

- 14 botanical books and floras
- 7 books on rice weed or tropical weed management and others
- 11 field guides for weed recognition
- 3 multimedia products (CD-ROMs)
- 343 scientific papers on rice weeds and weed management
- 29 conference communications
- 1 student dissertation
- 5 technical reports.

The list can also be accessed on the website:
http://www.afroweeds.org/fr/ressources/bibliographie.html

It is updated regularly.

Activity 2b: Consultation of existing herbaria (West and East-Africa and France)

This activity was continued. Various herbaria have been consulted.

The AfricaRice herbarium based at Cotonou Benin now contains 154 specimens corresponding to 98 species.
A new, additional herbarium is currently being set up at the AfricaRice station in Dar es Salaam in Tanzania with specimens collected during the various field trips carried out in 2010 and 2011. It currently comprises 110 prepared and scanned specimens corresponding to 73 species.

Cirad's tropical weed science herbarium includes 815 specimens corresponding to 134 species of the AFROweeds project while Cirad's ALF herbarium comprises 1212 specimens corresponding to 113 species. At the moment 330 specimens corresponding to 141 species have been scanned.

Currently, the AFROweeds database contains about 440 scanned specimens corresponding to 144 species. Few AFROweeds project species are missing. A special effort will be made to collect these species during upcoming field trips.

The herbarium specimens at the botanical laboratory of the University of Cocody-Abidjan were scheduled to be scanned during the second year but civil war by the end of 2010 and part of 2011 made this action impossible. Until now it is not possible to work in the herbarium, further-more the herbarium is now endangered because of degradation of the equipment, lack of air conditioning and computers destroyed during the troubles.
African partners have collected specimens and scanned herbaria. For example, Mr. Sara Soungalo of the IER in Mali collected and prepared 41 herbarium specimens corresponding to 22 of the project's species. Prof. Friday Ekemele provided 37 herbarium specimens corresponding to 35 species.

The herbaria of Arusha and Dar es Salaam have been visited and discussions are ongoing with the University of Dar es Salaam on the bench fees that we should pay to digitalize the specimen of the near-200 species we have in our AFROweeds list.

Activity 2c: Field trip preparation

Field trip to rice schemes of the Senegal River Valley (Saint Louis – Senegal) were discussed during the second workshop at Cotonou in between Cirad team and Salif Dyack from SEAD (Société Nationale d'Aménagement et d'Exploitation des Terres du Delta du fleuve Sénégal et des Vallées du fleuve Sénégal et de la Falémé). Later on, with the agreement of the General Director of SAED a six day mission has been organised by Mr. Salif Dyack in the Saint-Louis area for Cirad agents in order to present the AFROweeds project and tools to SAED and other extension services in the region and make prospection for taking photos and collecting herbarium specimens of rice weeds.

Activity 2d: Field trips

Table 1 outlines the various field trips in West and East Africa during the second year of the project by AfricaRice and Cirad teams.
Reports of the different field trips are provided in Appendix 3.

Table 1: Summary of missions, and number of photos, herbaria of the 2nd AFROweeds project year

Mission	Undertaken by	Date	Total No. of photos	Usable photos	No. of herbaria digitalized	No. of herbaria taken	No. of field photos entered in DB	No. of herbaria photos entered DB
	AfricaRice							
Cotonou, Benin	JR, GK, KA	23/11- 05/12 2010			107		67	47 (representing 47 species)
Shinyanga, Tabora & Mwanza, Tanzania	KA	24-31/03/2011	563	100		20		
Cotonou, Come & Zinvié, Benin	JR, GK, KA	27/06 – 02/07 2011	655	158 (65)		85		
Mwanza, Tanzania	GK, SA, EJ	15-20/ 08/2011	1544	380 (14)		55		
Arusha & Moshi, Tanzania	GK, SA, EJ	06-11/09/2011	1924	400 (22)		75		
	Cirad							
Cotonou, Come & Zinvié, Benin	TLB, PG, NB	27/06 – 02/07 2011	1436	659			1315	90 (representing 35 species)
Saint Louis, Senegal	PG, AC	05 – 11/09 2011	1746	656	90	90		
Total	**7**		**6866**	**2353**	**197**	**235**	**1382**	**137**

1. In parenthesis indicates the number of identified species for those field photos and herbaria
2. JR- Jonne Rodenburg, GK- Gerald Kyalo, KA- Kobusinge Aloys, TLB – Thomas Le Bourgeois, NB – Nora Bakker, PG - Pierre Grard, AC – Alain Carrara, SA- Sarwatt Athanasi & EJ- Eunice John (the latter two were BSc students from Sokoine University of Agriculture (SUA), Morogoro, Tanzania.

Activity 2e: Organize an Online Review Meeting

"Virtual" meetings of the AFROweeds coordination team

Cirad's Pierre Grard, Doan and Pham Ngoc Hai (the Web managers) are in Hanoi - Vietnam, Pascal Marnotte is based in Cotonou - Benin since April 2011. The AfricaRice team (Jonne Rodenburg, Gerald Kyalo, and Kobusinge Aloys/Claude Runyambo) is located in Dar es Salaam - Tanzania, while Thomas Le Bourgeois, Nora Bakker and Alain Carrara are based in Montpellier - France. Work meetings using internet tools (Skype) are organised regularly to assess project progress made and to schedule activities. These meetings can concern 2 or more people depending on the subject.
During the second year 5 Skype meetings were organized. Their agendas and their reports are managed and stored in the "Group pages" of the AFROweeds coordination working group in the collaborative platform of the project. So that any one belonging to the coordination group of the project can consult and review the agenda and the report of a meeting.

In addition, Jonne Rodenburg travelled to Montpellier once (April 2011) for another meeting and seized the opportunity to meet with Thomas Le Bourgeois to discuss project progress.
Pierre Grard also travelled to Montpellier in August 2011 and spent 4 days at Cirad Montpellier to work with Thomas Le Bourgeois on the project.

Activity 2f: Organize in St Louis Senegal a workshop on collection of botanical information

When the AFROweeds project was first submitted, only one launching and one final workshop involving all partners and weed scientists were initially planned. During the discussions that took place at this initial workshop, it became clear that if the project was to make good progress, another workshop gathering African partners for research institutions and extension services needed to be scheduled during the second year. Thus a second participatory workshop was held in Cotonou while a presentation of the project was done in Saint Louis during a field trip.

The second AFROweeds workshop was held at the AfricaRice station in Cotonou, Benin from 28-29 June 2011 (Fig. 11). The full report is provided in Appendix 4.

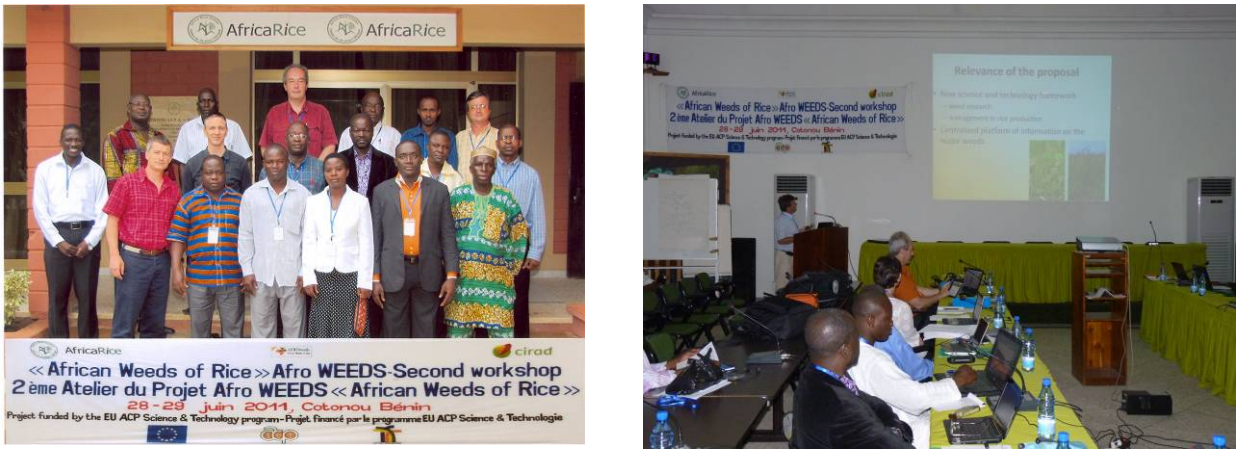


Fig. 11: Second AFROweeds workshop 28-29 June 2011 Cotonou – Benin, attendees and plenary session

The workshop brought together both project coordinating and partner teams (Cirad and AfricaRice) and 12 African partners working for national research and extension structures in 9 West, East and Southern African countries. The weed scientists and extension people are involved in the management of weeds of rice crops in Africa and wish to share their knowledge with all the players involved in African rice production. The participants were: Pascal Adéyèmi and Anago Codjo Emmanuel from Benin, Joseph Ipou Ipou and Koutou Assémien Apollinaire from Côte-d'Ivoire, Oumar Ouedraogo from Burkina-Faso, Sarra Soungalo and Daouda Diarra from Mali, Salif Diack from Senegal, Israel Dzomeku from Ghana, Friday Ekeleme from Nigeria, Irakiza Claude Runyambo from Rwanda and Tomas Fernado Chiconela from Mozambique.
Cirad was represented by Thomas Le Bourgeois (weed scientist), Pierre Grard (botanist and computer specialist), Pascal Marnotte (weed scientist) and Nora Bakker (management assistant). AfricaRice was represented by Jonne Rodenburg (weed scientist), Gerald Kyalo (research assistant), Kobusinge Aloys (research technician), Mariame Mariko (research technician), Amadou Touré (research assistant), Yonnelle Dea Moukoumbi (PhD student), George Maina (head of the finance), Leny Medenilla (budget manager), Carine Kan (secretary) and Savitri Mohapatra (communications manager).

During the workshop we presented again the AFROweeds project for new attendees and took time to present the collaborative tools (Web-site, Web 2.0 collaborative platform). We made sure everyone got registered to the collaborative platform and we explained how the platform works and what the benefits are. Training sessions were then organised in the use of the different tools of the platform (fora, albums, bookmark, working groups, etc.).
This workshop was followed by two days of field trips with CCR-MC, AfricaRice and Cirad people to visit rice fields of the Comé and Zinvié areas to take photos and collect herbarium specimens.

A small workshop was also held at the SAED station at Saint Louis – Senegal on 6 September 2011. This workshop brought together 13 people belonging to Cirad (P. Grard and A. Carrara), SAED, ISRA (Institut Sénégalais de Recherche Agricole), AfricaRice, PAPRIZ (Projet d'Amélioration de la Productivité du Riz dans les Aménagements Hydro-Agricoles), PINORD (Programme d'appui aux initiatives du Nord), Projet Bey Doundé (Projet "Bey Doundé" pour la Fédération des Périmètres Autogérés), 3PRD (Programme de Promotion du Partenariat Rizicole dans le Delta du fleuve Sénégal). The AFROweeds project was presented as weel as the tools for collaborative work. People got registered to the platform and trained in its use (Fig. 12). (See report in Appendix 3).

Fig. 12: Workshop at SAED Saint Louis Senegal

This workshop was followed by four days of field trips with SAED and Cirad people to visit rice fields of the Dagana and Podor areas to take photos and collect herbarium specimens.

Activity 2g: Scanning the specimens

Currently, the AFROweeds database contains about 440 scanned specimens (Fig. 13) corresponding to 144 species. Few AFROweeds project species are missing. A special effort will be made to collect these species during upcoming field trips.

The herbarium specimens at the botanical laboratory of the University of Cocody-Abidjan were scheduled to be scanned during the second year but civil war by the end of 2010 and part of 2011 made this action impossible. Until now it is not possible to work in the herbarium, further more the herbarium is now endangered because of degradation of the equipment, lack of air conditioning and computers destroyed during the troubles.
African partners have collected specimens and scanned herbaria. For example, Mr. Sara Soungalo of the IER in Mali collected and prepared 41 herbarium specimens corresponding to 22 of the project's species. Prof. Friday Ekemele provided 37 herbarium specimens corresponding to 35 species. All of them are entered in the database.

This activity will be continued during the third year of the project.

Fig. 13: Scanned specimen of *Sida acuta*

Activity 2h: Botanical description texts

Complete descriptions on botany, biology, ecology and control currently count 136 species in French and 87 species in English.
The species descriptions are regularly updated on the webpage for consulting at http://www.afroweeds.org/fr/ressources/information-especes.html

Control methods can be focused on species, but for all the species a direct link exist to general descriptions of rice weed management in French and in English categorized per weed management option as well as per weed category (perennial grasses, annual grasses, perennial sedges, annual sedges, perennial broad-leaved, annual broad-leaved, parasitic and aquatic species).

The identification characters needed to create the composite picture computer-assisted identification tool have been completed for 136 species among the 188 species of the initial list.

Activity 2i: Weed control methods

African partners were supposed to compile the information they have on weed control methods.
Various aspects are taken into account:

- Control methods against one or a few species (e.g.: *Cyperus* spp., *Rhamphicarpa fistulosa, Striga aspera*)
- Control methods against wild rice (*Oryza barthii, O. longistaminata*…)
- Control methods against rice weeds (mutant *Oryza sativa* that has become a rice crop weed)

- Rice crop weeding methods with a distinction being made between lowland and irrigated rice production systems.

Until now it is quite difficult to get this information from African partner. But, since the collaborative platform will be increasingly used, this information will be progressively integrated into the database and updated regularly.

Two review documents have been written on weed control in lowland rice. One provides a concise (10-11 pages) overview and description of weed control technologies of lowland rice. This document is available in English and French.
A second document provides guidelines for the control of 8 different groups of weeds highlighted during discussions of the first workshop: annual and perennial grasses, sedges, broad-leaved species, parasitic weeds and aquatic weeds. This document is now available in English and will soon become available in French too.
These documents are stored in the "group file" of the weed management working group of the collaborative platform. They are accessible both from the collaborative platform (they can be read or downloaded) and from each HTML species information pages by a direct link.
All these documents will provide useful information on control covering all species and discussing all likely effective measures, ranging from high to low input methods. The reason for storing them in the "group files" of the collaborative platform is to allow any member to make a comment on a document through the collaborative platform. All comments are visible to all members and can generate discussions between them. Furthermore, they are taken into account to regularly update the documents.

Activity 3: *Data Integration, implementation of the knowledge base (identification and control measures)*

Activity 3a: Feeding the species description databases

Complete descriptions on botany, biology, ecology and control currently count 136 species in French and 87 species in English. Control methods can be focused on species, but for all the species a direct link exist to a global text on rice weed management in French and in English.

The whole species pages can be consulted from the Web site of the project (thumbnail "Resources" + "Species information") or from several working groups of the collaborative platform (AFROweeds general, Botanique-Identification).
The direct access is http://www.afroweeds.org/fr/ressources/information-especes.html

The IDAO SVG identification system is available at http://www.afroweeds.org/idao/ and has been completed for 136 species.

Activity 3b: To realize the different drawings of the composite picture used in the identikit system

Preparation of the drawings used to construct the composite picture computer-assisted identification system (IDAO SVG system). These are vectorial drawings representing the different modalities of the botanical, ecological or geographical characters used.

Forty-one characters were selected during the initial workshop in Cotonou to develop the composite picture computer-assisted weed identification tool (IDAO SVG system), i.e.:

- 35 morphological characters represented by 271 modalities
- 5 environmental characters represented by 15 modalities
- 1 geographical character represented by 11 modalities.

Of the 297 modalities corresponding to the 41 selected characters, 271 are drawn and are already used in the composite picture computer-assisted identification system using IDAO SVG process.

Drawings of the additional modalities are being prepared and will be finished in the course of the third year.

Activity 3c: Image processing

Various actions were undertaken in the image processing activity

- Collection of plant photos during field trips,
- Selection of existing photos in the collections of various partners
- Scanning of silver-based photos,
- Scanning of herbaria specimens,
- Renaming of the image files using the principle presented at the initial workshop in Cotonou to avoid duplicates and group together all the images of the same species,
- Input and management of image information in the project database.

Table 2 shows the result of this activity.

Table 2: Number of photos selected, collected, prepared and entered into the database

Item		**Very good quality**	**Good/Medium quality**	**Total**
Photos	- AfricaRice collection	1580	1574	3154
	- Cirad collection	9785	4451	5227
	- AfricaRice selection	250	600	850
	- Cirad selection	1629	1791	3423
	- Other Partners selection			329
	- Entry in the AFROweeds database	**1689**	**2013**	**3697**
Percentage of species with at least one photo in the database				**93%**

Currently 175 species among the 188 of the project species list has at least one photo while four species have more than 100 photos (*Echinochloa colona, Eclipta prostrata, Heteranthera callifolia, Physalis angulata*). Contribution of African partners in the acquisition of photos is increasing regularly. At the moment 329 photos are selected and entered in the database from eight partners from Côte d'Ivoire, Ghana, Mali, Burkina Faso, Nigeria, Rwanda, and Mozambique. Among them 173 are from Pascal Marnotte since he is based in Benin. Prof. J. Ipou Ipou from Côte d'Ivoire was supposed to send a lot of images but civil war from end 2010 disturbed a lot all activities until now.

Activity 3d: Translation of the botanical descriptions

Currently 136 full species information pages are written in French and 87 are fully (55) or partially (32) written in English.
The whole species pages can be consulted from the website of the project (thumbnail “Resources” + “Species information”) or from several working groups of the collaborative platform (AFROweeds general, Botanique-Identification).

Portuguese translation of the species information pages is not available at this time. Such a translation cannot be paid by the project budget. We would prefer this could be done by partners as a collaborative contribution to the project. Since we have now a Mozambican partner of the project, Tomas Chiconela from the University of Maputo, we are going to discuss with him how students from the University could contribute in translating species information in Portuguese to make them available to all Portuguese speaking populations in Africa.

Instant translation can be obtained using Google Chrome navigator. But it does not provide a perfect translation.

Activity 3e: Glossary

A botanical illustrated glossary exists already for IDAO applications in French, English and Spanish languages (Fig. 14). It concerns about 465 different terms.

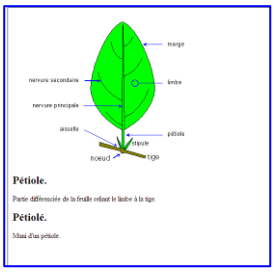


Fig. 14: Example of illustrated glossary in French

This glossary still needs to be updated and made available directly from the species information sheets.

Activity 3f: Integration of IDAO and software development

A major effort was devoted this year to IDAO SVG development. This is a new version of the IDAO process that can be used through Internet using drawings in SVG format. This new version of IDAO allows a better adaptation of the product when it is necessary to add more characters for identification and/or new species.
The AFROweeds identification system is now available from the Web site of the project (thumbnail “Resources” + “Online weed identification”) and from several working groups of the collaborative platform (AFROweeds general, IDAO SVG, Botanique - Identification) (Fig. 15).

It can be directly used at the address: http://www.afroweeds.org/idao/

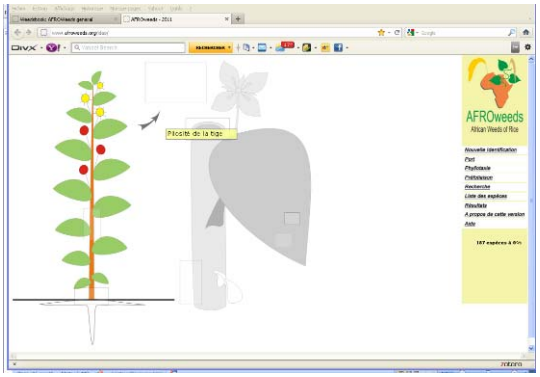


Fig. 15: Home page of the AFROweeds identification system using IDAO SVG process

The IDAO SVG process was used because it is able to respond to difficulties encountered by non-botanists when identifying species using standard flora and focused on three major constraints, namely:

- The inability to identify the species without its flowers or before its flowers;
- The use of dichotomous key, which cannot tolerate any error and imposes the choice as well as the order of questions; and
- The use of technical terms not understood by the non-specialists.

In order to minimize and resolve these constraints, the IDAO identification process uses a graphical system which reconstitutes the plants using images. This method has several advantages:

- It only uses drawings instead of technical jargon.
- It provides users the freedom to choose the character that needs to be described.
- Missing information or data are permitted, thus allowing for the identification of incomplete samples.
- Certain level of observational errors is also tolerated.
- At each step of the identification process, a probability of resemblance is calculated for each species.
- Thus species are sorted by decreasing order of similarity.
- At each step and moment, users can access the photos, the description, and the botanical illustrations of the species.
- In case users encounter doubt in the choice of characters (for description), they could ask the program for the most pertinent one.
- If the probability of a species identified is less than 100 percent, the program indicates the characters that contain wrong descriptions.
- Descriptions of the species are available through the Website with any type of browser.
- The program being multilingual, it caters to a larger section of people.
- Distribution of the species with GIS capabilities

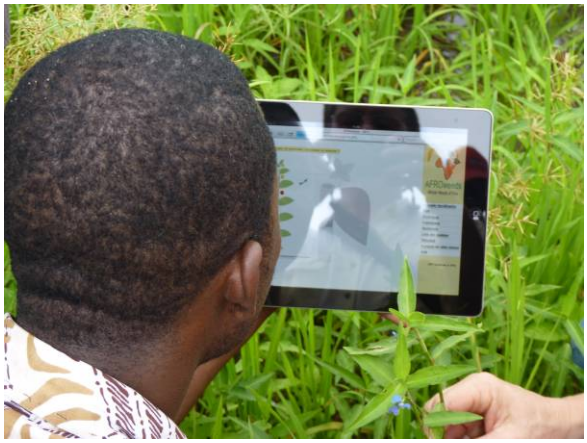
To explain the use of this AFROweeds identification system, several commented screen shots of the tool are presented in Appendix 5.

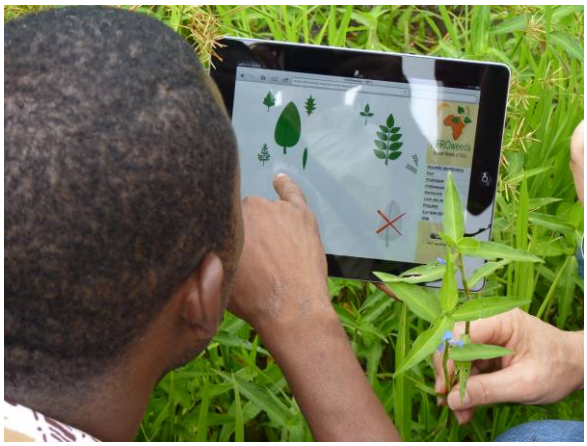
IDAO SVG corresponds to the SVG version of IDAO which can be used only through Internet. It means that the computer used has to be connected to the Internet (Cable, Wi-Fi or 3G+ card).

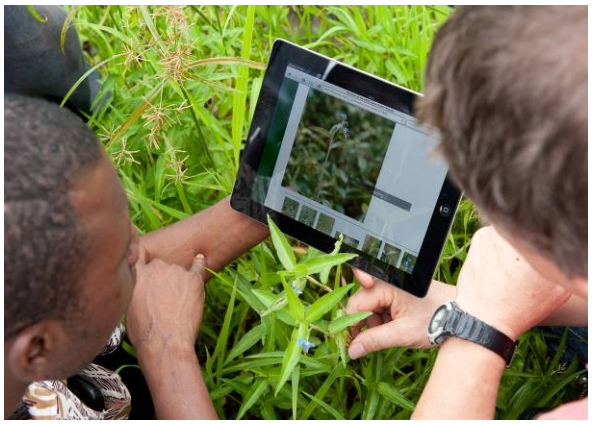
This AFROweeds identification system can be used on a computer but also on tablets with a 3G+ phone card. This kind of use has been presented to partners during the workshops at Cotonou - Benin and Saint Louis – Senegal (Fig. 16).

Fig. 16: Demonstration of the use of the IDAO SVG system on a tablet during the workshop

This was also tested in rice field conditions during field prospection in Benin in July 2011 with extension people of the CCR Mono and Couffo. A local 3G+ phone card was bought at Cotonou (Figs. 17 – 22).





Figs. 17-22: Use of AFROweeds identification system IDAO SVG with a tablet by Emmanuel Codjo agent of the CRR Mono & Couffo, in a rice field at Comé – Benin (P. Marnotte and P. Grard - Cirad)

Activity 4: *Dissemination sessions and generate feedback on* AFROweeds *knowledge base. Launching of the CD and the web-based versions*

Activity 4a: Dissemination sessions / Communication

An internet link to the Cirad site http://idao.cirad.fr was created on the AFROweeds website to disseminate general information on tropical weeds and on the composite picture computer-assisted identification system (IDAO) to AFROweeds project partners and associates.
The website presents the principles of composite picture identification, various multimedia tools already used in Africa, Asia or countries in the Indian Ocean to identify and retrieve information on crop weeds, and provides access to 460 species description sheets available in the different tools. It is an important documentary resource for partners and associates.

From the AFRoweeds collaborative platform, Web links are available to several African Website on rice production or plant protection. On the other hand, links to the AFROweeds Website have been made available on this Website to guide those interested in plant protection (DIVECOSYS) or in rice production (CCR MN) to the AFROweeds Website.

Communication actions and actions undertaken to boost project visibility

During our second project workshop late June 2011 in Cotonou we have made a video featuring Jonne Rodenburg, Thomas Le Bourgeois and three national partners (Friday Ekeleme, Salif Diack and Joseph Ipou Ipou) to explain the project and comment on it. This video featured prominently on the AfricaRice website in the month of July/August and is currently still available at http://www.africarice.org/ (scroll down the page and find videos in the bottom-right corner; click on the arrows until you find the video entitled “EU-funded AFROweeds”).

We also included a link to the AFROweeds website in a “Story of the Month” research brief published on the AfricaRice website http://www.africarice.org/warda/story-weed-management.asp.

A communication in the form of 300-word abstract have been submitted, published by the widely distributed CGIAR SP-IPM newsletter (for CGIAR researchers working on crop protection) and the editor of IPMnet (distributed among over 7,700 subscribers) promised to accept an article on AFROweeds once it is in a more advanced stage (Appendix 6.2).

We have published and presented (Jonne Rodenburg et al.) an abstract on AFROweeds at the 10th African Crop Science Conference in Maputo, Mozambique on 11 October 2011. At this conference, both Jonne Rodenburg and Gerald Kyalo, as well as a two current members, were present and brochures (English and French) were disseminated (Appendix 6.3).

Jonne Rodenburg also organized and moderated a workshop on 'Advancing Weed Research in Africa' to discuss the likelihood and feasibility of an African Weed Science Society network. An association of weed scientists (or agronomists working on weeds) in Africa called "African Weed Science Network" (AWSN) was proposed. The AWSN will primarily work through a website. The website will feature a comprehensive database of weed scientists in Africa with names, addresses and professional profiles and will enable any interested individual to quickly assess 'who-does-what-and-where'. The Website will further consist of pages containing relevant information on events (e.g. workshops, conferences), capacity building opportunities (e.g. scholarship information), and calls for funding, (new) publications and discussion fora. In addition the website could contain a weed species database with photos and identification tools and information on management, similar to the one created by AFROweeds (http://www.afroweeds.org) and which could be the continuing of the AFROweeds project expanded to all weeds of cropping systems. As an additional feature, the AWSN could disseminate a regular newsletter (for instance 2 times a year). The AWSN will link with the Southern African Weed Science Society (http://www.weeds.org.za/) to make use of the existing weed scientist database for Southern Africa. The same can be done with other national societies like the one of Nigeria (WSSN). The AWSN will initially operate under the umbrella of the already existing African Crop Science Society (ACSS; http://www.acss.ws/). (Appendix 6.4)

A brochure presenting the AFROweeds project (English version and French version) was published and distributed to partners and associates (Appendix 6.5 and 6.6).

2.1. Please list all contracts (works, supplies, services) above 5000€ awarded for the implementation of the action during the reporting period, giving for each contract the amount, the award procedure followed and the name of the contractor

During the second year, no contract above 5000€ was awarded for the implementation of the action.

2.2. Please provide an updated action plan [3]

Table 3 shows the updated action plan of the ARFROweeds project.

Table 3: Updated action plan of the ARFROweeds project.

Year 3 of the AFROweeds project													
	Semester 1						**Semester 2**						
Activity	**Month 1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Implementing body**
2a - Bibliography													CIRAD + AfricaRice + NARS
2b - Consultation of existing herbaria													CIRAD + AfricaRice + NARS
2d - Field trip													AfricaRice
2e = 4e – Online review meetings													
2g - Scanning the specimens													CIRAD + AfricaRice + NARS
2h - Botanical description texts													CIRAD + AfricaRice
2i - Weed control management													CIRAD + AfricaRice + NARS
3a - Feeding the species description databases													CIRAD + AfricaRice
3b - Drawings of the composite picture IDAO													CIRAD
3c – Image processing													CIRAD + AfricaRice + NARS
3d – Translation of botanical descriptions													AfricaRice + NARS
3e - Glossary													CIRAD
3f – Integration IDAO SVG													CIRAD
3g - Workshop (Tanzania)													CIRAD + AfricaRice
4a - Dissemination / communication sessions													Mainly Web 2.0 Mngmt. CIRAD and AfricaRice (Dissemination)
4b – Integrate suggestion for improvements													CIRAD + AfricaRice + NARS
4C –Finalize CDROM and pub.													CIRAD + AfricaRice
4f – Final workshop (Benin)													CIRAD + AfricaRice + NARS
4e – Reporting to EC and pub.													CIRAD + AfricaRice

Despite the action plan of the project proposal, for which some activities were planned to stop during the third year, it appeared that most of regular activities can be continued all along the third year.

The tools used in the project (e.g. Database, Collaborative platform, IDAO SVG system for identification), allows to update the available information on species as soon as new data is entered.

All actions and data that can be updated regularly due to the acquisition of new information, will be continued throughout the third year of the project, such as Bibliography, Herbaria scanning, Photo taking, Species information managing, Image processing, IDAO SVG Integration, etc.

Aiding tool to assess activities

Description of the activity		Executed in the reporting period	Outputs (reference to OVI)	Comments on achievements	Appendix
1.a	Open project Website	100%	Website available	Updated regularly	http://www.afroweeds.org
1.b	Open Web2.0 Participatory tools	100%	Participatory platform available	Evoluting according to members use	Appendix 1 http://www.afroweeds.org/network
2.a	Biliography	100%	Can be consulted through the Website or the collaborative platform	Updated regularly	
2.b	Consultation of existing herbaria	70%	Data entered in the database, can be consulted in species web pages	Will be continued during third year	
2.c	Field trip preparation	6 field trips	Managed by CRR-MC in Benin, SAED in Senegal and AfricaRice in Tanzania	Will be continued during third year	
2.d	Field trips	6 field trips	Mission reports and data entered in the database	Will be continued during third year	Appendix 3.1 to 3.8
2.e	Organize a online review meeting	5 online meetings	Reports available for project coordinators on the Collaborative platform	Will be continued during third year	
2.f	Organize in St louis a workshop	Replaced by a second participatory workshop at Cotonou	Report of the second Workshop	Second workshop at Cotonou because AfricaRice weed scientist is no longer based in Saint Louis and also allows	Appendix 4

				administrative meeting	
2.g	Scanning specimen	60%	Data entered in the database, can be consulted through species web pages	Will be continued during third year	
2.h	Botanical description text	72% in French 46% in English	Information managed in the database, can be consulted through species web pages	Will be continued during third year along with Portuguese version	http://www.afroweeds.org/fr/ressources/information-especes.html
2.l	Weed control methods	80%	Global rice weed management in English and French available on the collaborative platform Specific weed management according to weed categories quite finished.	Will be updated during third year	
3.a	Feeding species description	72% in French 46% in English	Information managed in the database, can be consulted through species web pages	Will be continued during third year	
3.b	Realize drawings for identikit system	70%	IDAO SVG identification system available from the Website and the Collaborative platform	Will be finished during third year	
3.c	Image processing	80%	3697 images entered in the database	Will be continued during third year	
3.d	Translation of the botanical description	72% in French 46% in English	Botanical descriptions are written directly in French or in English	Translation in Portuguese will be done with help of Mazambican	

				partners during third year	
3.e	Glossary	Available for 465 terms	Need to be linked to species web pages	Will be done during third year	
3.f	Integration of IDAO	Beta version of IDAO available for 72% of the species	IDAO SVG tool available from Website or Collaborative platform	Will be continued during third year	Appendix 5 http://www.afroweeds.org/idao
4.a	Dissemination sessions/communication	3 sessions organized during Cotonou and St Louis workshops, and Maputo conference Integration to GRiSP 700 brochures	Reports, abstracts and proposal 700 AFROweeds brochures in English and French distributed	Will be continued during third year	Appendix 3.7, 3.8,4, 6.2 to 6.6

3. Partners and other Co-operation

3.1. How do you assess the relationship between the formal partners of this Action (i.e. those partners which have signed a partnership statement)? Please specify for each partner organisation

AfricaRice partner:

Working relations are good, both technically and administratively even if it is not always easy to respect administrative procedures following the EU rules.
It should be noted that a collaborative research agreement was established at the end of 2009 and signed on 15 January 2010 by AfricaRice and Cirad. It specifically defines the technical and administrative contribution made by each partner and the allocated budget.

Both CIRAD and AfricaRice are also in the new Global Rice Science Partnership (GRiSP) for which the AFROweeds project is considered as a first step (or first stone) in the building of a global collaborative tool and platform on rice weeds at a world level.
AFROweeds features in the GriSP plan is under Product Line 3.3: "P 3.3.2. Management options for pests, diseases, and weeds", Milestone 3.3.2.2 (2012) "Tools and website on African rice weeds finalized and published".

The presence of the Cirad's project administrative assistant, Mrs N. Bakker, in Cotonou for the second workshop, was useful in that she explained again and clearly redefined the administrative operating rules of the European Commission. Comments made by Cirad coordinator on financial or functioning aspects of the project have been taken into account by the AfricaRice partner.

Regular contacts by video conference (5 in the second year) and meetings in Cotonou, and Montpellier allowed for regular administrative and technical updates on the state of project progress.

The involvement of outside partners in project activities is not always easy to manage. Partners interested in the project have difficulty getting involved due to the lack of a specifically allocated budget. It is difficult to make them understand, despite several explanatory attempts, that they are not being requested to perform a particular task requiring specific financing, but rather that the project is an opportunity that provides the technical means for them to summarize knowledge that they have already acquired during their research projects or that they are in the process of acquiring so that it may be shared and discussed with all the members of the network in the aim of it becoming accessible to all. During the second year we have re-emphasized that again and we sense that an active group of interested collaborators is now starting to emerge. This became also evident during the workshop organized at the 10th ACSS conference in Maputo, where we met great enthusiasm for AFROweeds and the idea to start an African network for weed science.

3.2. How would you assess the relationship between your organisation and State authorities in the Action countries? How has this relationship affected the Action?

During the second year, relations between the AFROweeds project and State Authorities in the various Action Countries were limited to the participation of "conseiller scientifique" of the French Embassy in Benin to the workshop at Cotonou – Benin in June 2011. Project computer tools and products (website, databases, species data sheets, and identification systems) are not yet sufficiently finalized to justify use by decision-makers and State Authorities.

3.3. Where applicable, describe your relationship with any other organisations involved in implementing the Action:

- Associate(s) (if any)
- Sub-contractor(s) (if any)
- Final Beneficiaries and Target groups
- Other third parties involved.

Weed scientists/agronomists from universities, national research institutions and extension services of 9 countries of the concerned region were invited to participate in the second project workshop that was held in June 2011 at the AfricaRice Centre in Cotonou (Benin). Among the participants were representatives of two new countries, Rwanda and Mozambique and we have invited four representatives of extension services (those of Mali, Cote d'Ivoire, Senegal and Benin).
The workshop in Saint-Louis (Senegal) was dedicated to people from national research institutions and extension services working in rice production in Senegal.
Other partners from other institutions have joint the project trought the collaborative platform. Table 4 lists organisations having people involved in the Action.
The network of partners is growing regularly.

Table 4: List of organisation involved in the Action

Institution	Country
SAED (extension service)	Senegal
University For Development Studies, Faculty Of Agriculture, Tamale	Ghana
College of Crop and Soil Sciences, Michael Okpara University of Agriculture, Umudike	Nigeria
CSIR-Crops Research Institute, Kumasi	Ghana
ISAR Rwanda Agricultural Research Institute	Rwanda
Conseil Régional des Riziculteurs du Mono Couffo (extension service)	Benin
INRAB – SPRR, Bohicon	Benin
IER, Niono	Mali
Office du Niger (extension service)	Mali
INERA, Ouagadougou	Burkina-Faso
Botanical Laboratory, University of Cocody-Abidjan	Côte d'Ivoire
CODERIZ (extension service)	Côte d'Ivoire
Eduardo Mondlane University, Maputo	Mozambique
AfricaRice Senegal	Senegal
ISRA	Senegal
PAPRIZ (extension service)	Senegal
PINORD (extension service)	Senegal
Projet Bey Doundé (extension service)	Senegal
3PRD (extension service)	Senegal
University of Buea,	Cameroon
Department of Plant Science, University of Zambia	Zambia
Mikocheni Agricultural Research Institute	Tanzania
Sokoine university	Tanzania
SAVANA (Phytosanitary company)	France
SSI (Phytosanitary company)	Afrique
Inter-réseaux développement rural (ONG)	France
Wageningen University	The Netherlands
Institut de Recherches Agronomiques et Forestieres (IRAF)	Gabon

3.4. Where applicable, outline any links you have developed with other actions

During the 10th ACSS conference in Maputo and again during the stakeholder joint conference Edulink ACP S&T programmes in Bruwwells, we (respectively J. Rodenburg and T. Le Bourgeois) met with Prof. Phil Stevenson, project leader of the EU-ACP funded ADAPPT. We have discussed ways to set up a network and will reflect on how we can collaborate in the future.

The AFROweeds project is now included in the research programme of GRISP (Global Rice Science Partnership http:// www.grisp.net). The GRISP is led by IRRI, AfricaRice, and CIAT in collaboration with CIRAD, IRD, JIRCAS. It aims to provide a single strategic plan and unique new partnership platform for impact-oriented rice research for development. It is designed to more effectively solve development challenges. GRISP is a research cooperation between international research centers working on rice (IRRI, AfricaRice, and CIAT), French national research centers (Cirad and IRD) and a Japaneses research center JIRCAS.
AFROweeds corresponds to the Theme 3 Ecological and sustainable management of rice-based production systems, Product Line 3.3: "Product 3.3.2. Management options for pests, diseases, and weeds", Milestone 3.3.2.2 (2012) CD-ROM and website on African rice weeds finalized and published

If your organisation has received previous EC grants in view of strengthening the same target group, in how far has this Action been able to build upon/complement the previous one(s)? (List all previous relevant EC grants).

4. Visibility

How is the visibility of the EU contribution being ensured in the Action?

The various logos of the EU and ACP S&T programme appear on all the information and communications material produced in connection with the project (PowerPoint presentations, posters, brochures, and website). Brochures of the project in English and French have been published and distributed at several occasions (workshops, conferences, meetings...). (Fig.23) (Appendix 6.1, 6.5 and 6.6).

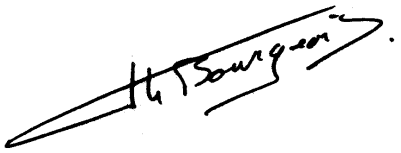
Fig.23: Banner of the second AFROweeds workshop at Cotonou – Benin 28-30 June 2011

The various logos of the EU and ACP S&T programme appear on all the technical support material distributed to partners and associates (Appendix 6).

The EU and ACP S&T programme are acknowledged in all communications presented at conferences (e.g. Conference of the African Society of Agronomy - Maputo 2011) and in all oral presentations.

The European Commission may wish to publicise the results of Actions. Do you have any objection to this report being published on EuropeAid Co-operation Office website? If so, please state your objections here.

Name of the contact person for the Action: Dr Thomas Le Bourgeois

Signature: 

Location: Montpellier, France

Date report due: 16th of November 2011

Date report sent: 28th of November 2011